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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/388,286	09/01/1999	GUY T. BLALOCK	150.01010101	3697

7590 06/18/2002

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EXAMINER	
SODERQUIST, ARLEN	

ART UNIT	PAPER NUMBER
1743	9

DATE MAILED: 06/18/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

MF-9

Office Action Summary

Application No.	Applicant(s)
09/388,286	Blalock
Examiner	**Art Unit**
Arlen Soderquist	1743

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *Apr 30, 2002*.

2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-3 and 6-35* is/are pending in the application.

4a) Of the above, claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-3 and 6-35* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a) ☐ All b) ☐ Some* c) ☐ None of:

1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

*See the attached detailed Office action for a list of the certified copies not received.

14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

a) ☐ The translation of the foreign language provisional application has been received.

15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
4) ☐ Interview Summary (PTO-413) Paper No(s). _____
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

1. Due to the comments in the response received April 30, 2002 relative to the previous rejection under 35 U.S.C. 112 1st paragraph, applicant is prohibited from arguing that the alert is anything more than a change in the conductivity being noticed or the structure for generating an alert being more complex than structure that can convert the measurement into a value that is readable by an operator. Thus any device which displays the measurement inherently meets the claimed structure or step for generating an alert.

2. Claims 2 and 11 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Claim 2 is redundant because the gas phase material has been limited to ruthenium in claim 1. The gas phase material portion of claim 11 is redundant for the same reason given for claim 2.

3. Claims 22-27 and 29-35 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The terms "smooth" and "structured" in the above claims are relative terms which renders the claim indefinite. The terms are not defined by the claim, the specification does not provide a standard for ascertaining the requisite degree, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention. There are varying degrees of smoothness and roughness and the specification fails to give examples of what would be considered smooth or structured. It is also noted that the newly cited Sano reference teaches that materials such as polypropylene have a morphology that is visible using RuO_4 staining techniques. For examining purposes a glass slide will be treated as being smooth and a polymeric material will be treated as meeting both of the smooth and structured limitations based on the Sano teachings above.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 12, 15-17, 19-20, 32 and 34 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hacman (GB 1,151,482) or N.V. PHILIPS (FR 1576658).

In the published application Hacman teaches temperature measurement for forming thin films on substrates by vacuum vapor deposition. The temperature (100-400°) of glass substrates in the vacuum vapor deposition of metals is controlled by measuring the electrical resistance of a strip of identical deposit-free glass between two electrodes. To avoid polarization, the measuring current is a.c. Both warming and reliable temperature control of the substrate lead to better adherence of the deposited metal. Page 1, lines 65-75 teach of the known use of conductivity to measure a layer growing on a heated surface. Page 2, lines 65-71 teach the application of the device to automatic vapor deposition plants in which control devices permit vapor deposition when a particular resistance value has been reached. Figure 1 shows the sensor which is a glass substrate (preferential deposition material) with two electrodes.

In the published application N.V. PHILIPS teaches thin-film metal oxide resistors. Metal oxide films having high resistances (1-500 kilohms/square) are fabricated by depositing (e.g. by evaporation in a vacuum) a series of metal films (e.g., Nichrome). Each film in the series is oxidized almost completely before deposition of the following one. Both the deposition and the oxidation of each layer are monitored by measuring the resistance of similar layers deposited onto a nearby glass substrate which has electrodes and leads already attached. For Nichrome films, the substrate temperature is 350° and deposition of a given layer is halted when the resistance of the control film has decreased to 200 kilohms/square. The air pressure in the bell jar is then increased to 6×10^{-4} torr and oxidation proceeds until the resistance of the control stops increasing. The pressure is then reduced, and subsequent layers are added. An alternative method, yielding films of greater uniformity and higher resistivity, involves evaporating the Nichrome $(1\text{-}5) \times 10^{-5}$ torr. Oxidation can then occur to some extent while evaporation proceeds, but is completed only by interrupting evaporation periodically to allow oxidation at higher pressures.

6. Claims 12-14, 16-18, 20 and 32-35 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Tyutnev (newly cited and applied). In the paper Tyutnev teaches apparatus for measuring the radiation-induced surface conductivity in polymers. All aspects of radiation-induced surface conductivity in polymers are discussed with emphasis on the role of the bulk processes during measurement and possible side effects connected with low-energy secondary electrons. The conventional scheme of surface conductivity measurements is especially sensitive to secondary electrons and is fully controlled by secondary emission. A proposed 4-probe technique eliminates both these factors (bulk contribution as well as secondary emission). Conformal mapping is used to predict the electric field distribution in this geometry and across the gap between the source and drain electrodes. Figure 1 and its associated discussion teach a structure which anticipates the above claims.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-3 and 6-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koda (newly cited and applied) in view of Ohlsson or Yuan (both newly cited and applied) and Hacman, N.V. PHILIPS or Tyutnev as discussed above. In the abstract Koda teaches a determination of ruthenium (Ru). Because of the paucity of analytical data for Ru in materials in general, Ru was determined in a large number of inorganic compounds and 2 types of seaweeds by neutron

activation. The sample was oxidized, the volatile RuO_4 was captured on a polyethylene film placed on the mouth of the flask, and the film was irradiated in a reactor with neutrons. Since the NaI(Tl) detector had low resolution, the 511-keV peak had to be subtracted in order to obtain the area under the ^{103}Ru 497-keV peak. When using a 1-g sample, the detection limits were 1 and 5 ppb Ru with a Ge(Li) and NaI(Tl) detector, respectively. Koda does not teach conductometric detection or using a glass or polypropylene surface for depositing the ruthenium.

In the paper Ohlsson discusses the use of ruthenium tetroxide in studies of polymer blends by scanning electron microscopy. Flat samples of blends of polypropylene (I) and triblock SBR rubber or hydrogenated SBR (SEBS) were contrasted with RuO_4 and studied in a SEM provided with a detector for back-scattered electrons. The images showed the SEBS phase as bright areas with dark dots and the I phase as dark. The dots in the bright SEBS areas corresponded to the unstained EB-domains of the triblock SEBS polymer. The technique used provided back-scattered electron detector images of high resolution. This is a consequence of the intrinsic electrical conductivity conferred to the sample surface by the Ru species deposited there during staining. Treatment with RuO_4 vapor conferred electrical conductivity to the stained areas, which explains the high resolution obtained with the technique.

In the paper Yuan teaches low-temperature chemical vapor deposition of ruthenium dioxide from ruthenium tetroxide as a simple approach to high-purity RuO_2 films. RuO_2 films were prepared by vapor deposition from RuO_4 on a variety of substrates including glass, silicon and aluminum. The RuO_4 precursor could be used in pure form or as a solution in H_2O, CCl_4 or pentane. The best films, as judged by both purity and adhesion, were obtained with pure RuO_4 as precursor by CVD at atmospheric pressure, by using a horizontal hot-wall reactor with the substrate at 150°. The RuO_2 films were characterized by conductivity and by XPS, XRD and SEM/EDX analyses. Overlayers of lead zirconate titanate (PZT) were then prepared and hysteresis in the $Si/RuO_2/PZT/Au$ structure was demonstrated.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use the device and methods of Hacman, N.V. PHILIPS or Tyutnev to detect the ruthenium compounds of Koda because of the recognized conductivity of the deposited materials

as taught by Ohlsson or Yuan and the ability to measure them conductometrically will remove the need for radioactive materials in the detection.

9. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321© may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

10. Claims 1-3 and 6-35 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-57 (renumbered) of copending Application No. 09/652,634. Although the conflicting claims are not identical, they are not patentably distinct from each other because the instant claim scope totally encompasses the scope of the claims of the copending application.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

11. Applicant's arguments filed April 30, 2002 have been fully considered but they are not persuasive. The previous rejection under 35 U.S.C. 112 1st paragraph has been withdrawn because of applicant's arguments. The previous art rejections have been withdrawn relative to the method claims. However the Hacman and N. V. Philips references are clearly anticipatory of the scope of claims 12, 15-17, 19-20, 32 and 34 drawn to a glass substrate with two electrodes thereon and means to measure the conductivity between the electrodes. The newly cited and

applied references address the changes in the claims and applicant's arguments relative to the method claims.

12. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The additional art relates to sensing of materials in which conductivity is measured.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Arlen Soderquist whose telephone number is (703) 308-3989. The examiner's schedule is variable between the hours of about 5:30 AM to about 5:00 PM on Monday through Thursday and alternate Fridays.

For communication by fax to the organization where this application or proceeding is assigned, (703) 305-7719 may be used for official, unofficial or draft papers. When using this number a call to alert the examiner would be appreciated. Numbers for faxing official papers are 703-872-9310 (before finals), 703-872-9311 (after-final), 703-305-7718, 703-305-5408 and 703-305-5433. The above fax numbers will generally allow the papers to be forwarded to the examiner in a timely manner.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Arlen Soderquist

June 13, 2002

ARLEN SODERQUIST
PRIMARY EXAMINER